



Truckee-Carson River Basins

Basin Overview

The Truckee River supports natural ecosystems and is a vital water source for more than 400,000 people. From its origins in the Sierra Nevada Mountains at elevations over 10,000 feet, the Truckee River Basin encompasses an area of approximately 3,060 square miles in California and Nevada. The Truckee River and several tributaries that feed into the River are important sources of municipal, agricultural, and environmental water for inhabitants of the Truckee River Basin, as well as the neighboring Carson River Basin where some Truckee River flow is diverted to support the Newlands Project, Stillwater National Wildlife Refuge and the Fallon Paiute-Shoshone Indian Reservation and Community.

Future Changes in Climate and Hydrology

Temperature

During the recorded historical period of 1900 to 2010, the mean annual temperature in the Truckee-Carson River Basins has already risen by about 3°F (degrees Fahrenheit). By the end of this century, another 5 to 6°F of warming is projected to occur in the Truckee River Basin.

Precipitation

The percentage of annual precipitation falling as snow (versus rain) has decreased over the last century. Currently, about 34 percent of precipitation at Tahoe City, California falls as snow, compared with 54 percent at the beginning of the last century. Projections of annual precipitation in the Truckee-Carson River Basins suggest that annual precipitation may decrease slightly by the end of the 21st century.

Snowpack and Runoff

With increasing temperature, less winter precipitation is projected to occur as snowfall, especially in the lower elevations in the Truckee-Carson River Basins. In addition, increased temperatures will cause earlier snowmelt and runoff. These temperature effects, along with potential declines in precipitation, are projected to result in a declining snowpack in the Truckee River Basin

during the 21st century. By the mid-century, there is a projected shift to significantly more winter runoff due to warming in the wettest months, but spring runoff is still significant. However, by the end of the century, continued warming is expected to significantly shift runoff to the winter months.



Truckee River

Adaptation Strategies

Truckee River Basin Study

The Truckee River Basin Study was a collaboration between Reclamation, the Placer County Water Agency, Tahoe Regional Planning Agency, Truckee Meadows Water Authority (TMWA), and Truckee River Flood Management Authority (TRFMA). The study evaluated water supply augmentation strategies, demand reduction strategies, and potential institutional changes to address system vulnerabilities.

Truckee Canal Extraordinary Maintenance

In 2019, Reclamation's Technical Service Center prepared the Truckee Canal Engineering and Economic Feasibility Design Study to evaluate risk reduction measures along the Truckee Canal to reduce the risk of a canal breach for public safety. Reclamation is proposing to assist the Truckee-Carson Irrigation District with extraordinary maintenance to address safety needs along the Truckee Canal.

Collaboration

Truckee River Operating Agreement

The Truckee River Operating Agreement (TROA), signed in 2008 and implemented in December 2015, is an agreement for operation of the Truckee River Basin. TROA creates flexibility in water use and storage while ensuring that existing water rights are served, and flood control and dam safety requirements are met. Principally, TROA provides for more effective coordination of reservoir operations on the Truckee River.

Newlands Project Credit Water

The use of Newlands Project Credit Water (NPCW) is a process within TROA that allows for the storage of Newlands Project water in Truckee River reservoirs. The goal of NPCW is to maximize the use of Carson River water and minimize the diversion of Truckee River water in order to benefit threatened and endangered fish species in Pyramid Lake. In 2019, the first year of implementation, NPCW saved over 16,000 acre-feet of Truckee River water from being unnecessarily diverted to the Carson River Basin.

Innovations

Reclamation and water users in the Truckee-Carson River Basins have implemented numerous innovations to address challenges and improve water management. An example is presented below:

Derby Dam Fish Screen

In September 2020, Reclamation completed construction of the Nation's largest horizontal fish screen at Derby Dam near Reno, Nevada. The fish screen is a critical investment to modernize Reclamation's infrastructure to provide reliable water supplies for irrigation customers in an environmentally sound manner. The project promises to greatly improve passage for Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*) journeying to upstream rearing and spawning habitat for the first time in a century.



Nation's largest horizontal fish screen at Derby Dam

Next Steps

The Truckee River Basin Study partners including the TMWA and TRFMA, along with the TROA administrator and numerous other supporting stakeholders, were awarded a pilot project to work with the U.S. Army Corps of Engineers to devise and test new, more flexible flood control criteria and to evaluate the use of weather forecasts to inform reservoir operations in the Truckee River Basin.

To see the full basin report and other components of the 2021 SECURE Water Act Report, please visit:
<https://www.usbr.gov/climate/secure>